

CLAIMS.

1. A method of transmitting data using multi-carrier Code-Division Multiple Access (CDMA) for accessing a transmission system, the method comprising a step of modulating the data to be transmitted using Orthogonal Frequency-Division Multiplexing (OFDM) for producing OFDM modulated data symbols and a step of spreading the OFDM modulated data symbols with spreading codes including a set of predefined sequences wherein the sequences are predefined so that they satisfy predetermined auto-correlation and/or cross-correlation criteria within a region around the origin, defined as an Interference-Free Window (IFW).
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2. A method as claimed in claim 1, wherein the transmission system comprises a transmitter, a receiver and a transmission channel, for transmitting the data from the transmitter to the receiver via the transmission channel, the transmission channel including a set of multi-paths with associated time lengths, the transmission channel having a channel delay spread defined as a time length corresponding to an estimate of a difference between the time lengths of at least two different multi-paths, the length of the Interference-Free Window (IFW) depending on the channel delay spread.
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3. A method as claimed in claim 1, wherein the sequences are such that their off-peak partial autocorrelation and partial cross-correlation values are zero within the Interference-Free Window (IFW).
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4. A method as claimed in claim 2, wherein the sequences are such that they comprise zero gaps.
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5. A transmitter for transmitting data using multi-carrier Code-Division Multiple Access (CDMA) for accessing a transmission system, comprising a modulator for modulating the data to be transmitted using Orthogonal Frequency-Division Multiplexing (OFDM) for producing OFDM modulated data symbols and a mixer for spreading the OFDM modulated data symbols with spreading codes including a set of predefined sequences, wherein the sequences are predefined so that they satisfy predetermined auto-correlation and/or cross-correlation criteria within a region around the origin, defined as an Interference-Free Window (IFW).
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6. A method of receiving multi-carrier data sequences transmitted via a transmission system using multi-carrier Code-Division Multiple Access (CDMA) for accessing the transmission system, the data sequences being OFDM modulated before being spread with a set of predefined sequences satisfying predetermined auto-correlation and/or cross-correlation criteria within a
5 region around the origin, defined as an Interference Free Window (IFW), the method comprising a step of demodulating the received multi-carrier data sequences with respect to a predefined set of sub-carriers and to the set of predefined data sequences.
7. A receiver for receiving data sequences transmitted via a transmission system using multi-carrier Code-Division Multiple Access (CDMA) for accessing the transmission system, the data
10 sequences being OFDM modulated before being spread with a set of predefined sequences satisfying predetermined auto-correlation and/or cross-correlation criteria within a region around the origin, defined as an Interference-Free Window (IFW), the receiver comprising a set of rake combiners tuned to associated sub-carriers for demodulating the received data sequences.
8. A computer program product for a transmitter computing a set of instructions, which when
15 loaded in the receiver, causes the receiver to carry out the method as claimed in claim 1.
9. A computer program product for a receiver computing a set of instructions, which when loaded in the receiver, causes the receiver to carry out the method as claimed in claim 6.
10. A system comprising at least a transmitter and a receiver for transmitting data from the transmitter to the receiver using multi-carrier Code-Division Multiple Access (CDMA) for
20 enabling the transmitter to access the transmission system, the data to be transmitted being modulated using Orthogonal Frequency-Division Multiplexing (OFDM) before being spread with a set of predefined sequences wherein the sequences are predefined so that they satisfy predetermined auto-correlation and/or cross-correlation criteria within a region around the origin, defined as an Interference-Free Window (IFW).